FY2002 ITWF: AWARDS

ABSTRACTS OF 10 PROJECTS – alphabetical by first pi name

EIA-0203127
PI's: Janice E. Cuny, William Aspray, Joanne Cohoon and Jolene Jesse
Institution: Computing Research Association
Title: Factors Concerning Recruitment and Retention of Women Graduate Students in Computer Science and Engineering

This ITWF award provides support to the Computing Research Association (CRA) to study an important aspect of the largest under-represented group in the IT workforce, the graduate education of women. Using experience gained in a previous Best Practice Report (Janice Cuny and William Aspray, "Recruitment and Retention of Women Graduate Students in Computer Science and Engineering", Computing Research Association, Washington, DC 2001) on recruiting and retaining women in computer science and engineering (CS&E) graduate school, the project will study U.S. CS&E graduate programs in order to identify and quantify links between the program's recruitment and retention practices and their outcomes.

Results expected from the study include a description and assessment of the existing recruitment and retention practices in 50 CS&E departments with doctoral programs; a measure of the impact recruitment practices have on the female proportion of new students enrolled; a measure of the impact retention practices have on the female proportion of students retained through the doctorate; a set of materials that departments can use to make self-assessments; an evaluation of the effectiveness and comprehensiveness of the practices recommended in the Best Practices Report; and findings that can be generalized on the link between recruitment and retention practices and their outcomes with respect to female graduate students.

EIA-0204267
PI's: Mary L. Good and William M. Mitchell
Institution: U. Arkansas, Little Rock
Title: The Research Component of a Model IT College

This ITWF award provides support to the University of Arkansas, Little Rock to use the tools of IT to serve the educational enterprise in the same way that these tools support business enterprises. In 1999 the state of Arkansas recognized the shortage of IT workers and created the College of Information Science and Systems Engineering, called the Cybercollege of Arkansas, at the University of Arkansas at Little Rock. The Cybercollege will design a database that will house data on every facet of the college's recruitment and first-year student experience across four computer-based four-year degree programs. The database will:

- provide a test-bed for conclusions derived from demographic and pedagogic research from other studies.

- be mined for new associations and clusters of experience and behavior patterns that will suggest research in new directions.
- provide data on the IT students of Arkansas and on the efficacy of the various strategies that the Cybercollege has implement to achieve its mission.
- prototype recruitment and retention databases that could be installed in other IT college and thereby contribute an important tool to further the understanding of the efforts of IT colleges to serve underrepresented population groups.

Once built, this dynamic data model will be sustained within the Cybercollege and the data that it collects and the analysis that it engenders will provide insight to the longitudinal problem of maintaining the supply of college-trained professionals in the IT workforce nationally.

EIA-0204469
PI's: Kshiti Joshi and Kristine M. Kuhn
Institution: Washington State U.
Title: What Does it Take to Succeed in Information Technology ? A Multi-Level Analysis of Stakeholders' Perceptions of Critical Attributes and the Effects of Stereotype Fit.

Washington State University has been awarded an ITWF grant to examine beliefs about the attributes of successful IT professional, applying social psychological research on gender stereotypes and cognitive processes in performance evaluation to the case of IT professionals. The study will examine associated effects on employee satisfaction, commitment, and performance.   Key research questions include: What are the desired characteristics of IT workers that are necessary to be successful in IT occupations? Do the desired characteristics fit men more so than women? How do evaluation and reward systems impact the retention of workers in the IT workforce?

EIA-0204316
PI's: Donna C. Llewellyn, James D. Foley, J. Joseph Hoey, S. Gordon Moore, Jr., and Marion Usselman.
Institution: Georgia Institute of Technology
Title: APSIT: Alternate Pathways to success in Information Technology

This ITWF award provides support for the Alternate Pathways to Success in Information Technology (APSIT) program which seeks to explore the nature of the IT and engineering educational and career pathways used by successful female and minority Georgia Tech alumni. The objectives of the project are:

1. To determine, through the use of paper and telephone surveys, face-to-face interviews, and institute records of Georgia Tech alumni, whether the educational and career strategies used by white women and by men and women from underrepresented ethnic groups differ from the strategies used by white men in their successful pursuit of IT and engineering degrees and careers.

2. To explore correlations between high school and college educational success (as measured by grade point average, and standardized test scores) with indices of later success in the IT and engineering work force, and to analyze these correlations by gender and ethnicity.

3. To explore IT and engineering field-specific differences in educational and career success for women and minorities.

EIA-0204430
PI's: Debra A. Major, Donald D. Davis, Joan Mann and Janis V. Sanchez-Hucles
Institution: Old Dominion University
Title: Climate for Opportunity and Inclusion: Improving the Recruitment, Retention and Advancement of Women and Minorities in IT

This ITWF award provides support to investigate how characteristics of the information technology (IT) workplace can foster increased retention and advancement of women and minorities. In the first year, several work organizations with IT departments of varying sizes and demographic compositions will be recruited to participate in the study. Survey and interview data will be collected from human resource directors, IT supervisors and IT employees in order to assess the climate for opportunity and inclusion of each department. The goal is to identify barriers and enablers to the career success of women and minorities in IT departments. In the second year, a survey feedback intervention will be conducted in each participating organization to encourage IT departments to capitalize on their strengths and improve their weaknesses with regard to opportunity and inclusion for all employees. In the third year, survey and interview data will again be collected to assess the effectiveness of the interventions implemented during the second year. The objective is not only to assist the participating organizations in establishing an inclusive workplace environment, but also to develop "best practices" that can be shared, through publications and presentations, with others in the IT field and researchers interested in workplace diversity issues.

EIA-0204138
PI: Danny B. Martin
Institution: Contra Costa Community College
Title: Mathematics Socialization & Identity

On almost every measure of mathematical achievement and persistence, African American students lag behind their peers. Because mathematics serves as a gatekeeper for information technology majors and careers, African Americans are also disproportionately shut out of these areas. In order to better understand the societal, community, school, and intra-personal forces that affect their under-representation, Contra Costa College and Dr. Danny Martin have been awarded a three-year ethnographic and observational study that will focus on mathematics socialization and mathematics identity among a diverse group of African Americans.

The participants in this study will be African American parents, community members, students and teachers of students selected from communities in two northern California

cities—Richmond and San Pablo. Both cities are located within 50 miles of Silicon Valley and have significant African American populations. The two cities also have school systems that are representative of many urban districts. The project will also focus on selected programs, services, staff, and students at Contra Costa College, an institution that has had a high rate of success in transferring minority students to four-year colleges and universities in mathematics, computer science, and engineering.

EIA-0204464
PI's: Joshua L. Rosenbloom and Ronald A. Ash
Institution: University of Kansas
Title: Characteristics and Career Paths of Current IT Workers

This award provides support for a study that will identify important decision points in the educational and work experiences of Information Technology (IT) workers that have led them to enter and remain in the IT workforce. The results of this study will document the normal patterns of entry and retention in the IT workforce to provide a baseline to examine the special problems of women and minorities who are greatly underrepresented in this expanding and lucrative sector of the economy.

Through a survey of both current IT and non-IT workers in the greater Kansas City area, the project will gather data on individual personality traits in conjunction with detailed family background, and educational and work histories. These data will in turn be used to identify aspects of attitudes, family background, and educational and work experiences that have influenced individual decisions to enter IT jobs, as well as to remain in (or exit from) them. Among IT workers the same data will be used to explore differences by sex, and race and ethnicity. The results will illuminate both the similarities between IT and science and engineering career choices, and the differences.

EIA-0204246
PI: Eileen M. Trauth
Institution: Pennsylvania State University
Title: A Field Study of Individual Differences in the Social Shaping of Gender and IT.

The under-representation of women in the information technology (IT) field is a significant factor in the American IT skills crisis. Unfortunately, there is a lack of sufficient theory to provide a basis for explanation and prediction about this gender imbalance. The goal of this research is to investigate the particular ways that women IT professionals in America are influenced by and react to the social shaping of both gender identity and IT. Three specific objectives are directed at the achievement of this overall goal. The first objective is to refine an emergent theory of individual differences about women's participation in the IT sector. The second objective is to articulate the ways in which individual and environmental factors are influencing American women in their professional development and current working lives as IT professionals. The third objective is to develop recommendations for proactive responses by public policy makers, employers and educators.

This research builds upon and extends into the American context the emergent theory and methodology that were developed by the Principal Investigator and applied in Australia, New Zealand and Ireland. Participants in the study are women who work in the IT field both as practitioners and as academics. In-depth interviews with women in the IT sector in selected geographic regions of the U.S. capture the influence of socio-cultural factors in different geographic regions of the country. Four themes about environmental influences that emerged from previous research are used to structure the interview schedule: culture (expressed through societal and workplace influences), educational institutions, family, and government policy. The emergent theory of individual differences is used to focus the data analysis on the ways in which these respondents – as individual women – are responding to socio-cultural influences. Interview data is supplemented by participant observation data and by documentary data about gender and the IT sector in the regions involved in the study. Three themes that emerged from previous research are used to focus the analysis of the data: personal characteristics of the respondent, individual influences experienced by the respondent, and individual responses to environmental influences.

EIA-0204222
PI's: Mladen A. Vouk, Sarah B. Berenson and Joan Michael
Institution: North Carolina State University
Title: Women and Information Technology: A Comparative Study of Young Women from Middle Grades through High School, and into College

This ITWF award to North Carolina State University will support the development and testing of a model of the factors associated with young women's decisions to persist in advanced mathematics and computer science courses so as to prepare themselves for, and decide to make Information Technology (IT), their career. IT careers are defined as those requiring an electrical engineering, computer science, or computer engineering bachelor's degree. Success factors rather than failure factors will be examined in order to make a significant contribution to the research on gender and IT. The project's objectives are to:

    a) Identify school, social, and personal factors associated with young women's decisions to pursue undergraduate study in IT fields.
    b) Create and test a model using the above factors to predict young women's decisions to pursue (enroll into) IT undergraduate study.
    c) Disseminate the results of this study in professional publications, professional meetings, advisory board meetings, and in an electronic monograph to scholars, teachers, policy makers, parents, and young women.
    d) Propose appropriate interventions to increase young women's interest in IT careers based on this research model. To identify the factors, the investigators will implement the inquiry from a grounded theory perspective. Subjects will be young women, already identified as talented in mathematics in middle school, who participated in the NSF Gender Equity project, Girls on Track (GoT), beginning in the Summer of 1999.

EIA-0204253
PI's: Mark L. Wardell, Jacqueline K. Rogers and Steven B. Sawyer
Institution: Pennsylvania State University
Title: Women in the IT Workforce: How Level is the Playing Field?

This ITWF award provides support to study institutional contexts and their related factors that are theorized to affect the work-related outcomes of women after they enter the information technology (IT) workforce. By work-related outcomes is meant job tenure, job satisfaction, job mobility, job status, earnings and workforce retention. The project will focus on the IT specialties of software and information systems (as opposed to hardware or telecommunications) because they represent one of the fastest growing segments of the computer and IT industry.

The expanding employment opportunities in IT work have encouraged a popular view that possession of IT skills should level the playing field for all workers. In effect, this perspective implies that job opportunities, or alternately the lack of opportunities, are correlates of levels and types of skill workers possess. Collectively, the bundle of skills and experiences individuals bring to employers is known as human capital. The human capital view says little about the institutional contexts that circumscribe IT work, or about IT workers and their gender. This project theorizes that the job-related outcomes for women entering the IT workforce will be influenced by various institutional factors and that the outcomes of women will be different from those of men.